Newsletter of the North American Mycological Association

THE MYCOPHILE

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Membership just got a whole lot better. The website redesign is finally here!

As you've heard, we contracted with Vieth Consulting this year to makeover the website, install a member management system, and add new member-friendly benefits. In the Members Area behind this basic platform are many new features including forums, calendars, surveys, and ways to communicate news.

We designed the NAMA website for you, our members. The member management package includes many perks and more ways to connect to the larger mycological community. For example, instead of ***Mycophile*** Editor Dianna Smith laboring over the "send" button for hours, you'll see the newest issue of the newsletter as soon as it's posted through a web email blast. If you're curious about the most recent books and field guides to add to your mycological library, you'll find a section with more than a dozen of the latest book reviews. We'll be able to let you know about more national and local mycological events through a calendar feature. We will periodically add new stories about our affiliated clubs. We have updated the popular section on mushroom toxins and created a new report form for the Poison Case Registry.

NORTH AMERICAN MYCOLOGICAL ASSOCIATION
JOIN CLUBS ABOUT EDUCATION EVENTS PUBLICATIONS PHOTOGRAPHY CULTIVATION POISONINGS ART REGISTRY
Book Reviews
Mycological Word of the Day
Explore the New NAMA Website!
Book Reviews!
Join today!
NAMA Officers

Log in to register for the NAMA 2015 Blue Ridge Foray! Our signature annual event, this year hosted by the Asheville Mushroom Club and the Mushroom Club of Georgia, features Alan Bessette as chief mycologist, along with a team of cutting edge scientists and field mycologists. This will be the first year that NAMA has run online registration on our own website *(See pages 3-7).*

Starting on the home page, click on one of the slideshow images to open that topic. Find information inside using our new dropdown navigation. All pages on the website should be the same URL as the previous version — preserving any online links and bookmarks — with many new pages to explore. On May 1, we're launching a whole new section on Mushroom Dyes & Papermaking, created by several of the pioneers in this area: Susan Hopkins, Cheryl Dawson, Dorothy Beebee and Dorothy Smullen. You can find all the back issues of our peer-reviewed journal ***McIlvainea*** (and stay tuned for a new issue coming soon from our Editor Willow Nero).

This is just the beginning. In coming months, you'll see more new content and member benefit options. If you have something to contribute to the website, please contact me at webmaster@namyco.org.

There's a lot to see on the newly designed NAMA website. Start exploring today!

David Rust, NAMA President and Webmaster

FORAYS & OTHER EVENTS

This section of **The Mycophile** is reserved for publicizing the annual forays of NAMA affiliated clubs and other events you may be interested in learning about. If you would like us to list your club's next big event,

July24-26: The Eastern Penn Mushroomers annual Helen Miknis Memorial Foray will be held, with headquarters once again at the Mont Alto campus of the Pennsylvania State University, situated adjacent to the Michaux State Forests and several state parks. Further information and a registration form are available on line at http://www.epennmushroomers.org/2015%20Helen%20Mikinis%20Foray%20-%20Registration%20Form.htm The registration deadline is July 17.

July 30-August 2: NEMF's 39th Annual Sam Ristich Foray sponsored by the Connecticut Valley Mycological Society (CVMS) will take place at Connecticut College in New London, CT. Registration form is now online! http://www.cvmsfungi.org/nemfregistration.html

August 2-8: Mushroom Identification for New Mycophiles: Foraging for Edible and Medicinal Mushrooms workshop with Greg Marley and Michaeline Mulvey at the Eagle Hill Institute in Maine. Contact office@eaglehill.us.

August 28-30: 4th Annual Joint Appalachian Foray at Graves Mountain Lodge, Syria, Virginia, sponsored by The Mycological Association of Washington and the New River Valley Mushroom Club. Walt Sturgeon will be the Chief Mycologist. More details and registration form will be available on MAWs website, www.mawdc.org in March.

September 4-7: COMA's Annual Clark Rogerson Foray will take place again in the beautiful Berkshires near Copake NY, where Northwest CT, Southwest MA and NY meet. Check www.comafungi.org for updates.

September 6 -12: Ascomycetes, Waxy Caps, and Other Fall Fungi of New England workshop with Alan Bessette and Arleen Bessette at Eagle Hill Institute, Maine. For information on attending the course contact office@eaglehill.us.

September 17-20: Wildacres Annual Foray: Limit 40 participants. Details coming soon!

September 18-20: **Western PA Mushroom Club's 15th Annual Gary Lincoff Mushroom Foray**. Further information can be found at http://wpamushroomclub.org/.

September 24-27: NAMA Blue Ridge Foray sponsored by the Asheville Mushroom Club and the Mushroom Club of Georgia at the YMCA Blue Ridge Assembly in Black Mountain, NC. Registration is open! http://www.namyco.org/nama_blue_ridge_foray.php.

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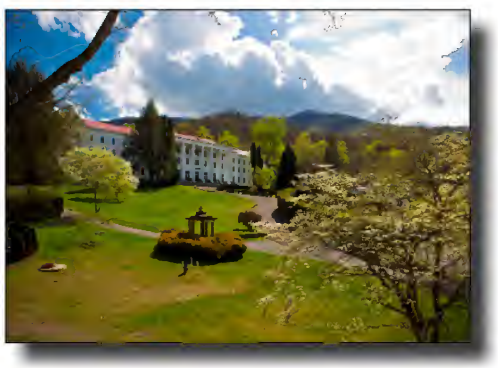
REGISTRATION FOR NAMA 2015 BLUE RIDGE FORAY IS NOW OPEN !!!

By Jackie Schieb

The Asheville Mushroom Club and the Mushroom Club of Georgia invite you to come and discover what makes Western North Carolina such a unique and varied location. The fun, exciting and educational 4 day event on September 24-27, 2015 will be centered at the Blue Ridge Assembly in beautiful Black Mountain, North Carolina. The Blue Ridge Mountain's climate, topography, and geological history have made the mountains of Western North Carolina the most biologically diverse area in the U.S.



The Blue Ridge Assembly has been hosting groups both large and small for 100 years. The facility is named after the Blue Ridge Mountains, a section of the Appalachian Mountains that runs from Virginia to Georgia. From Eureka Hall (pictured) one of the housing options you'll enjoy a vista of mountain ridges and peaks that seen from a distance take on a blue cast, rising to the highest peak of Mt. Mitchell at 6,684 feet. We'll have 1,200 acres available to foray along with other nearby sites proven to have great fungal diversity.

Traveling to the Blue Ridge Assembly is a short 25 mile drive from the Asheville airport.

You'll have a choice of three types of lodging at the Blue Ridge Assembly:

- **Best rooms**: hotel-style rooms in the Blue Ridge Center and Weatherford Hall which have two beds (at least a double bed and a single, many rooms have two doubles) and a bathroom in the room. This is the only option for people who prefer stair-free access. It's also best for families with children.
- **Standard rooms**: dorm-room style rooms in Eureka Hall with two single beds and a bathroom in the room.
- **Economy rooms**: dorm-room style rooms in Eureka Hall with two single beds but no bathroom in the room (bathrooms are shared by others on the same floor).

The Great Smoky Mountain All Taxa Biodiversity Inventory has identified 2798 species of fungi and the study is still going strong. The Asheville Mushroom Club's own species list stands at 900+ including the *Amanita mediinox* which was discovered on one of our club's forays by a long time member and later named by Rod Tulloss. With the NAMA foray participants gathering and the professional faculty identifying, we confidently expect to expand this total.

Forays will start on Thursday afternoon for early arrivals, continuing with both 2 and 4 hour trips to gather in a variety of unique locations. In September we can be fairly sure of finding Honey fungus (*Armillaria* species) in profusion, along with some Aborted Entoloma (*Entoloma abortivum*). Two species of Chicken of the Woods (*Laetiporus sulphureus* and *Laetiporus cincinnatus*) should be fruiting then, as well as Lobsters, the Beefsteak polypore, Hedgehog mushrooms, several Chanterelles, numerous *Suillus* species, and the lovely Shaggy-stalked Bolete (*Heimioporus betula*). Occasionally a massive fruiting of Jack O'Lantern (*Omphalotus illudens*) will turn the forest floor to gold and, if we are lucky, 10-lb tufts of Hen of the Woods (*Grifola frondosa*) will be found decorating the base of damaged oaks.

A unique variety of forays will be offered traveling to the Upper Piedmont region, and Southern Appalachian. There will be forays from easy, moderate to challenging. This is a partial list of forays that are being finalized.

Day long forays in the Southern Appalachians:

Deep Woods Mushrooms and Turkey Pen—a guided tour of the Deep Woods Mushrooms commercial operation, complete with complimentary homemade pizza lunch, followed by an afternoon in the damp mixed forest around the South Fork of the Mills.

Dupont State Forest both mixed hardwoods and extensive stands of low-lying white pine.

Half-day forays:

- Beaucatcher Overlook Park—a thirty-acre tract of undeveloped hardwood forest in downtown Asheville.
- Warren Wilson College—mixed forest types and pasture land.
- Curtis Creek—mature mixed forest leading to a waterfall.
- Shope Creek—white pine and mature hardwoods.
- Rattlesnake Lodge—a National Park Service permitted foray on the Blue Ridge Parkway. Mature hardwoods, at least some of which may be old-growth

Half-day in the Upper Piedmont area:

- Lake James State Park—short-leaf pines and hardwoods around Lake James.
- Private land near Marion, NC—predominantly hardwoods.
- Catawba Falls—a damp watershed of mature mixed forest leading to a waterfall.

A NAMA annual foray wouldn't be complete without a mycophagy experience along with classes, presentations, entertainment and time to meet and socialize with fellow NAMA members.

The following is a list of mycologists, speakers and instructors for the NAMA 2015 foray with some photos and bios included with more to come:

Alan Bessette, Arleen Bessette, Britt Bunyard. Cornelia Cho, Tradd Cotter, Todd Elliott, Rich Jacob, Jay Justice, Julia Kerrigan, Dan Lazar, Patrick Leacock, David Lewis, Brandon Matheny, Peter McCoy, Greg Mueller, Alan Muskat, Ron Petersen, John Plischke III, Elinoar Shavit, Paul Stamets, Walt Sturgeon, Rod Tulloss, Debbie Viess, Rytas Vilgalys and Tom Volk. Alan Bessette will be our lead mycologist, along with Arleen Bessette who will be teaching a beginner's class and lead a group to a nearby reserved area.

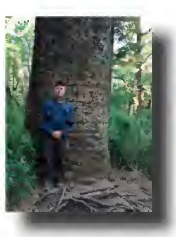
Alan Bessette is a mycologist & distinguished Professor Emeritus of Biology at Utica College of Syracuse Univ. He has published numerous professional papers in the field of mycology and with his wife, Arleen, has authored more than twenty books including *Mushrooms of The Southeastern United States* and his most recent book, *Ascomycete Fungi of North America*. His most current interest is researching fungi of the subtropical regions of the Southeast.

Arleen Bessette is a psychologist, amateur mycologist and botanical photographer. She has a special interest in myco-dyeing, the culinary aspects of mycophagy and exploring the nearly addictive passion of foraging. With her husband, Alan, Arleen has authored several books including *The Rainbow Beneath My Feet: A Mushroom Dyer's Field Guide* and *Mushrooms of The Southeastern United States*.

Britt Bunyard, PhD, is the founder, Publisher, and Editor in Chief of the mycology journal ***FUNGI*** which has the largest circulation of any mycological publication in North America. He also has worked as a full-time Biology professor in Ohio and Wisconsin, teaching a broad range of undergraduate and graduate courses in Evolution, Microbiology, Mycology, Invertebrate Zoology, Biochemistry and Environmental Science. The main focus of Britt's research interests has centered on the co-evolution of macrofungi and Diptera, the true flies. Bunyard has coauthored (2012) the recent book *Mushrooms and Macrofungi of Ohio and Midwestern States: A Resource Handbook* published by The Ohio State University Press.

Todd Elliott is a native to Western North Carolina and is passionate about studying the interrelationships of fungi with other organisms. This focus has taken him on research expeditions to remote corners of the world on six continents. Some of his research has resulted in peer reviewed publications including descriptions of fungal species new to science. Todd is also a performing artist and award winning nature photographer. His current research focuses are sequestrate fungal evolution, mycophagy, entomopathogenic fungal taxonomy, and the evolution and ecology of mycoheterotrophic plants. To read more about Todd and his current projects, visit his website: http://toddelliott.weebly.com/

Jay Justice is a retired epidemiologist who has studied the macrofungi that can be found in the Southern and Southeastern regions of the US for over 35 years. He is a co-founder and scientific advisor for the Arkansas Mycological Society (1982) and a scientific advisor to the Cumberland Mycological Society as well as a chief mycologist for the Missouri Mycological Society. He has recently participated in several conferences associated with the study of the macrofungi that occur in the Great Smoky Mountains National Park. In 2011 he was the recipient of the North American Mycological Association's "Contribution to Amateur Mycology" award. In addition to the genus *Amanita*, two other groups of the macrofungi that intrigue him are the Chanterelles and the members of the fleshy poroid fungi known as Boletes.



Dan Lazar served for many years as Director of Education at the Western North Carolina Nature Center in Asheville, followed by several years as Executive Director of the Colburn Earth Science Museum. Dan has been an instructor in the Blue Ridge Naturalist Program at the North Carolina Arboretum since 2005, where he teaches classes in Ecology of the Blue Ridge, Geology and Meteorology of the Blue Ridge, Insects of the Blue Ridge and Tree Identification. Dan has co-hosted a weekly radio show, "Nature News", broadcast locally on WTZQ Hendersonville, since 1993. Dan is also the founding president of the Asheville Mushroom Club.

Patrick Leacock has been studying the fungi of the Chicago Region for seventeen years, and also running the Voucher Program for the NAMA annual forays. Before that, Patrick started out with the Minnesota Mycological Society and served as Recorder at his first NAMA foray in 1988. Volunteers and interns assist him with collections and research at the Field Museum of Natural History. Patrick works closely with the Illinois Mycological Association via programs, forays and documenting mushrooms. He is assembling the rich Chicago mycoflora of over 1200 species. Patrick's website is www.mycoguide.com and the first IMA mushroom videos can be seen there.

David Lewis is a retired chemist and dedicated mycologist, with a B.S. and M.S. from Lamar University, Beaumont, TX, where his master's thesis was based on a study of East Texas mushrooms. Currently a Research Associate with the Field Museum of Natural History in Chicago and an honorary staff member of the Tracy Herbarium at Texas A&M University, he's also the Fungal Taxonomic Working Group leader for the Big Thicket National Preserve's All Taxa Biodiversity Inventory. President of the Gulf States Mycological Society since 1998, he has led many mushroom walks, looked for new fungal records for the Gulf coast and offered his fungal knowledge to many naturalist groups. In his mycological papers, David has described many species new to science, and is proud to have had several named for him. In return, David has received The North American Mycological Association's award for contributions to amateur mycology, and the R.E. Jackson Conservation Award from the Big Thicket Association. He and his wife Patricia, whom he met at a mushroom foray, live on 60 forested acres in Newton County, Texas where they enjoy plants, fungi and wildlife.

Brandon Methany is originally from Oklahoma and a history graduate from Oklahoma State University in 1991. He earned his PhD degree in Botany at the University of Washington under the guidance of Drs. Joe Ammirati and Ben Hall in 2003. Brandon spent five years as a post-doc at Clark University in David Hibbett's lab in Worcester, Massachusetts and was hired at the University of Tennessee in 2008 to do fungal systematics and evolution. Brandon is currently producing a monograph of the family Inocybaceae in Australia and, in collaboration with his graduate students, studying patterns of diversification in the Agaricomycetes. Brandon is currently Associate Professor in the Ecology & Evolutionary Biology Dept. at UT Knoxville, TN.

Gregory M. Mueller, Chief Scientist and Negaunee Foundation, Vice President of Science, Chicago Botanic Garden Research Associate, Field Museum of Natural History, Adjunct Professor, Biological Sciences, Northwestern University; Chair, International Union for Conservation of Nature Specialist Group on Mushrooms, Brackets, and Puffballs; past President of MSA. Greg Mueller's research focuses on the biology and ecology of fungi, especially mushrooms. He has undertaken fieldwork in many parts of the world. Having done his PhD at the University of Tennessee, he spent a lot of time in the Smokies and western North Carolina. He is author of six books/book length volumes and over 100 journal articles.

Alan Muskat, troubadour of the toadstool, founded No Taste Like Home, the first forage-to-table tour company in North America, and The Afikomen Project, the first wild foods public education program in the world. He has been featured on Bizarre Foods, The History Channel, PBS, Discovery, and in dozens of major magazines. When it comes to bringing out the fun in fungi, he's the champignon.

John Plischke III is a founding member of the Western Pennsylvania Mushroom Club, which has become one of the largest mushroom clubs in the US. He can be reached at fungi01@aol.com He is Walk and Foray Chairman of the WPMC and a member of the Speaker's Bureau. John has been awarded the club's Distinguished Service Award. John is an identifying mushroom expert for the Western PA Mushroom Club (WPMC), He is a life member of NAMA and a trustee to both NAMA and NEMF. NAMA has awarded John the prestigious Harry and Elsie Knighton Award. John is Chairman of the NAMA Photography Committee. He has also presented programs to many NAMA affiliated mushroom clubs. He is the editor of two WPMC wild mushroom cookbooks. John is the author of *Morel Mushrooms and Their Poisonous Look A Likes and Good Mushroom, Bad Mushroom.* John has won over 85 national and regional awards for his mushroom photography.

Paul Stamets, Sc.D. (Hon.), is the founder of Fungi Perfecti (www.fungi.com) and Host Defense Organic Mushrooms (www.hostdefense.com) , and has been a dedicated mycologist for over forty years. Over this time, he has discovered and coauthored new species of mushrooms, received nine patents, written six books and pioneered countless techniques in the field of edible and functional food mushroom cultivation. Two of his books, *Growing Gourmet & Medicinal Mushrooms* and *The Mushroom Cultivator* have been heralded as the 'bibles' of the mushroom industry. His latest book, *Mycelium Running, How Mushrooms Can Help Save the World*, has propelled his vision of using mushrooms to help save ecosystems and improve population health. Paul has received numerous awards and honors for his contributions to the science of medicinal mushrooms and ecology. His TED (2008) talk "How Mushrooms Can Help Save the World" has been rated in the top 10 of all TED talks, and viewed more than 2,600,000 times. His TEDMED (2011) introduced medicinal mushrooms to more than 800 physicians.

In January of 2014, Paul received the highly acclaimed NAMA (North American Mycological Association, www.namyco.org) award for expanding the field of mycology for both amateurs and professionals. In June of 2014, Paul was chosen as an Invention Ambassador by the American Academy for the Advancement of Science (AAAS.org), the largest and most prestigious scientific organization in the world. This honor was in recognition of bridging scientific discovery, education and applications from scientists to the public for societal benefit.

Walt Sturgeon lives in East Palestine, Ohio. He and his wife Trish have 2 children and 2 grandchildren. Field Mycologist and Retired Social Worker; Past President: Ohio Mushroom Society; Recipient of NAMA's Award for Contributions to Amateur Mycology and NEMF's Eximia Award; Author of *Waxcap Mushrooms of Eastern North America; Mushrooms, Macrofungi of Ohio and the Midwestern States, Mushrooms and Other Fungi of the West Virginia High Country*; Award winning photographer with photos published in numerous field guides.

Debbie Viess, aka "Amanitarita," is a biologist and naturalist, writer and artist. A former zoologist and animal behaviorist, she was seduced away from her work with the furred and feathered by the fascinating world of fungi, and has been seriously obsessed with various fungal studies for over twenty years. Amanitas and toxicology are particular passions. A long time San Francisco Bay Area resident, she Co-Founded the Bay Area Mycological Society (BAMS!) in 2006 with her husband David Rust. Debbie has written about mushrooms extensively both online and in print, and has lectured about mushrooms to mushroom enthusiasts and the general public across the country. She is a frequent source of mushroom information for media of all sorts, including newspapers, radio and television, and is a major contributor to the wonderful Mushroomobserver.org website.

Rytas Vilgalys, Professor Biology Dept. Duke Univ., Durham NC

The Vilgalys mycology lab uses '-omics' based as well as traditional approaches (microscopy, culturing, mating studies) to study the natural history of fungi. Research areas include: 1) the Fungal Tree of Life Project and the origins of fungal biodiversity- our principle research is focused on undertstanding phylogeny of fungi in fungi, including mushrooms (basidiomycetes), as well as the earliest fungal lineages; 2) molecular epidemiology and population genetics of fungi. Genetic studies are aimed at elucidating mating systems and life history in wild mushroom species as well as symbiotic fungi including human pathogens; and 3) molecular ecology of fungal communities. We are currently using nextgen sequencing technology to study the metagenomics of fungal communities including their interactions with plants across changing environments.

- PhD 1985 Virginia Polytechnic Institute and State University
- MS Botany 1982, Virginia Tech
- BA Botany 1978, State University of New York College at Geneseo

The NAMA 2015 event will be the perfect opportunity to bring the family as there are numerous activities such as:

- In Black Mountain, 10 minutes drive away, is a delightful small town with eclectic shops and restaurants. There's a golf course and many hiking opportunities.
- Chimney Rock State Park and Lake Lure are 45 minutes to the south, and Mount Mitchell State Park is about an hour away via the beautiful Blue Ridge Parkway.
- Asheville, 20 min to the west, offers a huge variety of shops, restaurants, art galleries, and music venues. The 250-room Biltmore House is a major attraction and the NC Arboretum, the Botanical Gardens at UNCA, and the WNC Nature Center are well worth visiting.
- For outdoor adventure, there's canoeing, whitewater rafting, ziplining, fishing and more. Full details on ExploreAsheville.com.

There are also some alternative lodging at Black Mountain:

- Camping: Asheville East KOA Campground 4 miles away, and Mama Gertie's Hideaway Campground 7 miles, both have RV and tent campsites and rustic cabins.
- Basic Motels: Super 8, Acorn Motel, Apple Blossom Motel - around $55 a night.
- Mid-level: Quality Inn - around $90
- Historic B&B: Black Mountain Inn, Monte Vista Hotel, Red Rocker Inn, Inn Around The Corner - from $115 up.

Unexpected Benefits From Hosting a NAMA Foray!

By Jay Justice

The Arkansas Mycological Society hosted the 2013 NAMA foray the last weekend in October, 2013 at a religious based conference center which was located in the Arkansas region of the Ozarks Mountains. Forays were conducted in the Ozark National Forest as well as designated areas in close proximity to the Buffalo National River over the course of the three day conference.

The NAMA vouchering team recorded about 292 taxa of fungi, the majority of which were mushrooms identified to the species level.

Fungal surprises that were revealed at this foray appeared in two varieties: (1) known species that had not been previously reported within hundreds of miles prior to their discovery at this foray and (2) taxa that were previously unknown to science, i.e., new species that had never been described.

Figure 1. *Hexagonia hydnoides*
Photo: Ron Postorino

The most exciting example of a fungus in the first category was *Hexagonia hydnoides* (Figure 1). This is a polypore that has a cap colored dark brown to almost black that is covered with long dark erect hairs that eventually fall off. I had seen this polypore previously in areas along the Gulf Coast, but I was totally surprised when it appeared on the collection table at this foray. I later learned that it had previously been reported as far north as Dallas, TX, but the discovery of it at the 2013 foray extended its known distribution farther North and East by several hundred miles.

Two fungi that fit in the second category of newly described species collected at this foray were *Ramaria admirartia* (Fig. 2 – image from the original article) and *Ramaria calvodistalis*, two new coral fungi, that were described in an article that appeared in the on-line journal ***MycoKeys***, Petersen RH, Hughes KW, Justice J (2014), Two new species of *Ramaria* from Arkansas. ***MycoKeys 8***: 17–29. doi: 10.3897/mycokeys.8.7356.

Figure 2. *Ramaria admirartia*

Although the species name *admirartia*, meaning surprise or astonish, and actually refers to the occurrence of a type of hyphae in the context of the stipe, it could equally refer to the features that this *Ramaria* exhibits. Those features being the bright and showy orange- red colors present in the tips of the branches and the strong brownish stains that the base develops when it is rubbed or handled in a rough manner.

Ramaria calvodistalis,(Fig. 3 – image from the original article) the other new *Ramaria* described in the same paper is not quite as showy as the previously mentioned *Ramaria*. It has a white base that does not bruise and branches and branch tips that are yellowish in coloration. The article cited above states that according to the ITS sequences available in GenBank, *Ramaria calvodistalis*' closest relatives are two unnamed collections from Mexico.

Figure 3. *Ramaria calvodistalis*

So should NAMA now include in their list of reasons that a local mycological society would benefit from hosting a NAMA foray the promise of discovering previously unknown fungi during the course of such a foray? Probably not, but as many have already discovered, the potential is high for, if not the discovery of species new to science, at least a range extension of known taxa.

Mycological Literature: Some Places to Look

By John Plischke III

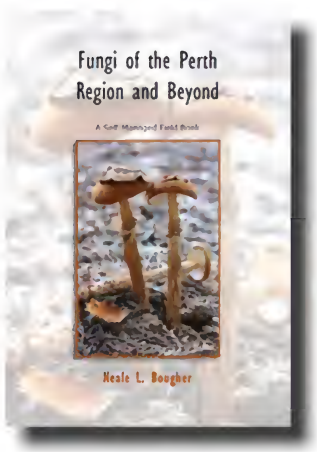
Every week or so but especially during the winter months when mushrooming is slim, it's good to add some digital literature to your mushroom collection. Usually it's a mixture of older and newer books and journal articles. It does not matter if the work is in from North America or not as long as it has good and interesting photos or text.

The information here is taken in part from a power point slide show and pass outs that I give on where to get mycological literature for free that covers over 2300 items. I will try to list over 1200 of them here.

If you know of any works that should be included in a possible future article please let me know.

Let's take a look at a few more modern non North American books that can be found online followed by some North American Books and finally some sources for mostly older books.

The *Red Book of Croatian Fungi = Crvena Knjiga Republike* Hrvatske by Tkalčec, Mešić, Matočec, and Kušan is available from the State Institute for Nature Protection. It is also available for download at https://www.dropbox.com/s/mupbib5t-m6g3hx9/CK_gljive_WEB.pdf. The book has very nice color photos and gives the Latin name for each species of fungus. It has 430 pages. Even though it is not in English it is definitely worth a look. *Google Translate* or other software can be used to translate the text of this book.



Fungi of the Perth Region and Beyond by Neale Bougher is available from Perth Urban Bushland Fungi at http://www.fungiperth.org.au/Fieldbook-all/Perth-Fungi-Field-Book.html. It has 280 pages.

A guide to common fungi of the Hunter-Central Rivers region is available from the NSW Government Hunter Local Land Services at http://hunter.lls.nsw.gov.au/__data/assets/pdf_file/0009/516807/guide-to-common-fungi-hcr.pdf It has158 pages.

A few of the free North American works include: *The Stipitate Hydnums of Nova Scotia* by Kenneth Harrison is available from the Internet archive at https://archive.org/details/stipitatehydnums00harr. It has 60 pages.

All of the mushrooms below can be found in the book, as well as many others. (These photos are all by John Plischke III.)

Hydnellum caeruleum

Hydnellum aurantiacum

Bankera fuligineoalba

Phellodon niger

Phellodon confluens

Auriscalpium vulgare

Keys to the Fleshy Basidiomycetes of Florida by Murrill and Kimbrough is available from the University of Florida at http://plantpath.ifas.ufl.edu/documents/Murrill_Fleshy%20Basidiomycetes%20of%20Florida_reduced.pdf. It has 204 pages.

There are also numerous places to look for free literature that's in the public domain, or that the publisher, author, university, etc. has made available online. Many of them are difficult to locate and there are too many to include here, but where to start? The larger places would be digital libraries. To make things easier I made some downloadable lists from some of the larger ones. Each of the following sites has more books on fungi than listed for it but often the sites have some of the same books as well as books that other sites do not. So for the following lists, the results have been filtered and any duplicates have been removed to make it easier to see what is available. Read through the lists and pick a few interesting titles to enjoy.

Google Books is one of the largest and easiest to download from, it offers PDFs and other formats. There are over 508 free fungi books. For a list of some of what is available there see https://home.comcast.net/~grifola/A1.pdf.

The internet archive has over 412 Mushroom/Fungi books. Unlike Google it has many government works. The site is easy to use. See https://home.comcast.net/~grifola/A2.pdf.

Hathi Trust, 98 Books. They do a great job of figuring out which works are copyright free or waved. Unless you have a password from an affiliated college or organization downloading is only possible 1 page at a time. However, everything on the list can be easily read on their site and nothing needs to be downloaded to be viewed. See https://home.comcast.net/~grifola/A3.pdf.

Other sources of free mycological literature include:
Biodiversity Heritage Library, 76 Books: https://home.comcast.net/~grifola/A4.pdf

Botanicus, 60 Books: https://home.comcast.net/~grifola/A6.pdf.

Gallica Bibliotheque Numerique, 40 Books: https://home.comcast.net/~grifola/A7.pdf.

Botanical Garden Madrid, 39 Books: https://home.comcast.net/~grifola/A8.pdf.

Core Historical Literature and Natural Resources Canada, 9 books: https://home.comcast.net/~grifola/A9.pdf.

NOTE ON REGIONAL TRUSTEE ELECTIONS

We have received nominations for the open positions:

Northeast: Joe Brandt
Mid-Atlantic: Bruce Boyer
Pacific North: Milton Tam
Southwest: Steve Pencall

With capabilities of the member management package, we will send ballots to every member in each of the four regions with a vacancy to hold the election online. Look for an email ballot soon!

Q & A with MUSHROOM OBSERVER

By Willow Nero: Editor of *The Potomoc Sporophore* and *McIlvainea*

In late 2014, Willow Nero spoke with Jason Hollinger and Nathan Wilson, the two amateur mycologists who run the Mushroom Observer website, a shared, online field book for fungi. The site's more than 5,000 users post data points (images, location information, descriptions, and more) about fungi, with the hopes of making scientific contributions in the field of mycology (and learning more mushrooms!) Mushroom Observer (MO) has become a prominent meeting place for mycologists working with macrofungi and likely will play a major role in the North American Mycoflora Project.

MAW is in the process of developing a complementary mycoflora program with Martin Livezey serving as the committee's chair. NAMA also has created a Mycoflora Committee, and its first reports are expected to be released by summer.

All answers in the following interview were provided by Jason, except where otherwise indicated.

Q: Describe the site for the absolute Web/mycology layperson.
A: I'd call it a specialized forum where mushroom lovers of all levels of expertise can post and discuss photos of mushrooms. It is particularly focused on helping folks share "observations" of real mushrooms encountered in the field.

Q: What do you see as obstacles for a first-time user, and how can they ignore obstacles to successfully make a post?
A: I think the site throws a lot of information and links at you right from page one. But really 99 percent of the site is all about just posting and viewing and commenting on observations. All you have to do is choose a user name and password and give us your email address (just so we can weed out spammers and send notifications). Then posting an observation of an unknown or neat mushroom is as simple as clicking on "Create Observation," filling in a few form fields, attaching an image or two, and clicking "Submit." It looks much harder than it is. The thing that surprised me the most early on was how quickly I would hear back from expert users!

Q: Why should amateur mycologists engage with this website as opposed to other naturalist sites?
A: To my knowledge, this and shroomery.org are the only forums devoted exclusively to mushrooms. Among our regular users are a large number of world authorities and highly experienced amateurs covering an extremely broad part of the fungal kingdom (and slime molds!) I think MO has proven particularly successful in hooking up amateurs with professional researchers. This should be particularly attractive to "serious" amateurs who'd like to make a modest contribution to science but who are understandably daunted by the extremely steep and long learning curve.

Q: What's the best way to get attention on a post?
A: Post pretty pictures! With good detail of the important features — and even better, show due diligence in recording habitat, substrate, texture, odor, etc.

Q: Why did you originally create the site, and has it morphed beyond that purpose?
A: I originally created the site primarily to make a relatively small collection (about 750 images) of my own available on the Web and to see if others would like to make their images available as well. It has grown way beyond my wildest dreams when I first created it. The most exciting things for me are the interactions with the professional mycology community and the resulting acknowledgements in scientific papers.

Q: Is MO part of the North American Mycoflora Project — or do you hope that it will have a place in the project?
A: MO has been included from some of the earliest discussions of the North American Mycoflora Project. Tom Bruns was a MO user long before he wrote the article in Inoculum (the newsletter for the Mycological Society of America) calling for the project, and he has always envisioned a component of the project very much along the lines of MO. Once the Mycoflora really gets off the ground, I expect there will be significant change to MO to support those efforts.

Q: What's the weirdest thing on there?
A: "Weirdest" is a matter of opinion. Some of my favorites are "*Calvatia indigo*": http://mushroomobserver.org/name/show_name?id=25984 and more seriously the rediscovery of *Hypocreopsis rhododendri* in North America after it not being observed there for nearly 100 years (http://mushroomobserver.org/139637). It's also a pretty weird fungus!

Q: As the creators, has the site proven its effectiveness to you personally? Have any posts of your own spurred previously difficult collaboration — or opened up whole new areas of interest for you?
Jason: I have contributed a handful of specimens from Los Angeles, the Great Smoky Mountains, the Florida Keys, and Tierra del Fuego to professional mycologists around the world. I don't know if any have wound up being used in describing species or been cited in papers, but just having researchers contact me to ask for specimens is a huge step above where I was pre-MO.

Nathan: I can't think of any specific posts that inspired new collaborations, but the site was key to my getting my current job leading the technical team for the Encyclopedia of Life (http://eol.org) and was important in creating an ongoing collaboration with Deborah McGuinness, a very well-known computer scientist at Rensselaer Polytechnic Institute.

Q: Where do you see the site in five years? Is there any talk of an app?
A: There are multiple users working on mobile apps as we speak. One in particular has made good progress and looks promising.
I also see [MO] as the digital meeting place for the North American Mycoflora Project and potentially even larger global projects of a similar nature. I hope it increases in value for the scientific community while remaining well-connected to its roots in the amateur community.

Q: I haven't seen any ads or sponsorships. How is MO funded?
A: MO is funded mostly out of pocket by Nathan, although donations from the last couple of years have helped defray the costs, too. It is surprisingly low-cost; I'd say the cost in time to develop and maintain the site is far more onerous of a burden.

While Mushroom Observer mostly is used for scientific purposes, a few jokes like this bright blue and curiously ceramic "*Calvatia indigo*" have propagated on the site, too.

Photo by Martin Livezey

Q: Are any new features or anticipated releases on the horizon?
A: Yes, we very much want to improve how the mapping works and how the naming system is managed. I also want to improve how name changes get propagated through the system. Ultimately I want to provide a way for people to better describe species in a way that automatically support a computer-aided identification system.

Q: Sometimes MO is a little slow. Is a fix in the works?
A: Our primary focus in the near term is to improve performance. We have recently moved to new hardware and have updated the software running the site. More is definitely in the works in this regard.

Q: Is it easy for developers to get involved?
A: Easier than ever! We've recently made huge improvements in this area. It takes less than an hour from start to finish to download and install a development environment on any platform, from which any user with any level of programming experience will be able to start working on countless issues from minor bug fixes to major feature development, graphic design, language translations, etc.

Q: I've heard some criticism (possibly unfair) of the open voting system and user-chosen naming system. Anyone can supposedly come along and gunk things up. Do you stand behind those features or hope to clean up the process eventually?
Nathan: I definitely have a lot of ideas about how to improve the naming system. I would be interested in any clear cases where someone has actually gunked things up. My general impression is the system has actually worked remarkably well, but there are some deeper conceptual issues that I hope to address in the near future. The idea is essentially to switch to a "last one wins" model similar to how determinations work in professional herbaria. To deal with cases where users are not confident in applying a name, they would have a way to suggest potential names without having that name "win." The biggest question with this model is at what point a name is considered accurate enough to share it with other biodiversity sites. I plan to make the exportability status of an observation much clearer, and I think there will need to be some sort of waiting period for unknown users before they can make official determinations.

Q: Do outdated species names in old posts automatically update?
A: No, by design. Instead we "deprecate" old species names. Observations of deprecated synonyms are still available for searches and range maps and such. We hope to add a tool some day which will allow users to formally propose more current names in place of old ones in bulk, but there are still some issues to work out, odd cases we don't know how to deal with yet.

Q: How do you stay interested in posting to the site while also developing it, being plugged into the mycology community, maybe working a day job, and anything else you do?
Jason: One of the advantages to being a developer is that you can work on the features you are interested in. Obviously, the overall vision is all Nathan's, and he has final say in any controversial policies or development directions. But by and large, we're happy for any help we can get, and developers have a great deal of latitude in deciding what to work on and how to implement it.

Nathan: It's a passion. The time I have for it changes over time, but it is part of my life and I know I'll always be adding to it.

This article first appeared in *The Potomac Sporophore*, Winter, January 2015, Volume No. 30, Issue 1

Soil Carbon and You: The Importance of Sequestering

By Larry Evans

Recently several scientific journals have addressed the issue of soil carbon sequestration. It seems that our methods of measuring the amount of carbon in soils have been inadequate, and the role of soil microorganisms in carbon sequestration and nutrient cycling have been underestimated. So, the dynamics of soils and the importance of fungi are even MORE than we supposed! It's not just a geek thing! Gramps was right, organics are what makes a soil RICH!

We know of the importance of mycorrhizae in acquiring nutrients for trees, but not so many of us realize the critical role of soil as a water reservoir, especially here in the arid west. Brown cuboidal rot (BCR) residues, common in rotting conifer logs, absorb at least five times their weight in water. These reservoirs provide an important means by which snow melt is captured and made available in the local ecosystem.

The hyphae of saprotrophic fungi break down these materials, digesting bacteria, and create chitin, the main component of fungal cell walls. The new studies indicate that much more soil carbon is tied up as chitin than previously suspected. Chitin is very stable and durable, and can retain carbon in the soil for long times.

Having now observed the immense capacity of these soil organisms to sequester carbon, are we doing something about it? Perhaps by outlawing the practice of slash pile burning after logging operations, instead mandate that prescribed amounts of coarse woody debris be buried, chipped, and/or inoculated with fungi. Fungi might be selected on the basis of their ability to produce an edible mushroom, their ability to produce water-retaining BCR residues, and value to wildlife. The USFS estimates that at a minimum 360 (upper estimates 700) million tons of carbon dioxide are put in the air annually from burning operations, and smoke from fire remains the most common complaint to USFS offices nationwide.

The act of burning wood is inefficient to start with: flaring off the water molecules present in wood absorbs a large amount of the energy released by the combustion process. This vaporized water and carbon dioxide then enter the atmosphere, and leave western Montana for somewhere downwind. Contrast that with buried wood, which has a half-life in the soil of several years, during which it will retain and supply moisture, yielding a net gain of moisture to the local environment when it is gone. Virtually all the energy and nutrients released by metabolism will be used by the local ecosystem. Although the life processes of the fungi result in the release of carbon dioxide, a good percentage of the carbon will remain in the soil.

I recently taught a section at a permaculture class, and they were all excited about Hugelkultur, a novel way to provide plants with moisture without irrigating, by burying a wood pile under your garden, or planting your garden atop your wood pile. In this case the rotting logs do what rotting logs do, absorb and retin moisture as they are broken down by fungi. Hugelkultur is another example of how natural processes can and should be employed in our management practices.

A familiar example of this, for all you naturalists, foresters, and ecologists, is the notion of a "nurse log" that supports and sustains young seedlings of tree species like western hemlock. The ghost of a tree on the forest floor provides habitat to insects, fungi, and bacteria as well.

Soil carbon could be the carbon sink that allows us to sequester enough carbon out of the atmosphere to balance our massive fossil fuel footprint. But we must review and revise the ways we manage soil, because now we are in the process of losing soil carbon, not sequestering it, on a landscape level.

Why is soil carbon important, again? Soil organic matter, which is about 50% carbon, often occurs in the form

of lignin-rich "brown rot" residues is the crumbly, cuboidal stuff left over when a rotten log goes soft. It absorbs about 5 times its weight in water. Mineral matter, another major component of our soils, little or absorbs none. Soil organic matter keeps water in the ecosystem.

Soil and Coal tell the History of Fungi

Many of you have already heard me tell the story of coal in lectures over the past couple years, and will share my delight in reading about recent research and publications that support this emerging viewpoint, notably David Hibbett of Clark University, and a recent Scientific American article by David Biello.

The story of coal begins over 300 million years ago (mya) at the beginning of the appropriately named Carboniferous Period. You paleontologists will recall that the Carboniferous is sometimes divided into the Mississippian and Pennsylvanian.

At the beginning of the Carboniferous, the early vascular plants and fungi were locked in a balance of creation and destruction: the complex materials that plants created by photosynthesis, the fungi and bacteria could break down with their site-specific enzymes. Then in a geologic instant, an ancestor of modern conifers and cycads managed to synthesize the cell-wall component lignin, and nothing has been the same since.

Unlike the thread-like cellulose molecule, which is made up of thousands of sugar molecules chained together using the same bond, lignins are hodgepodges of interlinked rings. Whereas a single enzyme can unzip a whole chain of cellulose, the digestion of lignin required the production of several different enzymes.

And so it went, for some 60 million years, more or less. Plants experienced a period of dominance, and as their lignin-laden bodies crashed to the ground, the carbon remained sequestered, piling up many meters thick in swampy places where these forests existed. Tremendous amounts of oxygen were liberated as carbon dioxide was reduced to lignin, and the levels of O2 in the atmosphere reached the all time high of 35%.

All this free oxygen had an effect. Insects, even with their poor gas exchange apparatus, achieved enormous proportions. Vertebrates got large, and carnivores got efficient. And this oxygen had an effect on the microbiota of the planet, especially among some lucky members of the Basidiomycota.

These fungi, in their daily work of breaking down wood, somehow managed to produce an enzyme that makes hydrogen peroxide from water and then abundant oxygen. Three of these exoenzymes that attack lignin are: laccase, manganese-dependent peroxidase, and lignin peroxidase. These enzymes manage to "burn apart" the complex bonds in lignin, recovering energy from a new source. This new ability allowed the White Rot Fungi to dominate the niche of wood decomposition and nutrient liberation, and effectively ended the Carboniferous Period about 245 mya. Today their descendants, spread across dozens of genera and 6 continents, continue to be the main drivers in decomposition and nutrient cycling in many forests.

Let's build on this to expand our understanding of the importance of carbon in soils. Terrestrial soil is the largest sink for carbon on our planet, vastly exceeding both the oceans and atmosphere in the carbon contained there. Recent studies from the Smithsonian Institute show that the carbon sequestered in ectomycorrhizal (EM)ecosystems (think conifers like pine trees and Douglas-fir with their *Suillus* fungal partners) is much greater than the carbon sequestered in ecosystems dominated by other major mycorrhizal type arbuscular (AM, which includes a range of plants, including most tropical trees and many temerate zone hardwoods) and should affect the way we manage these ecosystems.

Because of their efficient system of harvesting nutrients from dead plants and other organic matter, EM fungi leave behind lots of carbon but little nitrogen, phosphorus, potassium, or other biologically interesting mole cules. AM fungi on the other hand utilize different nutrient gathering techniques, resulting in more nutrients and bacteria in the soil, more glomalins, and less overall carbon sequestered in its reduced form.

Of course, many of you are now cringing, knowing that I am about to launch into another rant about the need to reform our current forestry practices to eliminate slash pile burning and address fuels reduction with metabolism rather than incineration. We need to place a much higher value on the presence of soil organic matter in our local Rocky Mountain neighborhood, or face an ecosystem collapse analogous to the Dust Bowl of the 1930's because we have removed too much material from the soil side of the carbon cycle.

The current adminstrative head set of "fuel reduction" by burning needs to be replaced with a mantra of "Don't pyrolyze, Metabolize!"

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Mushroomer's Lament

Sung to the tune of "Both Sides, Now" (with apologies to Joni Mitchell)

Fields and trails with fungal things
Growing wild in fairy rings
And colors rampant everywhere
I've looked at 'shrooms that way
But now they've changed their every name
And it's not clear who is to blame
They have just failed to stay the same
Things known have slipped away

I've been to NEMF and NAMA too,
Both east and west, with much ado
But little now do I recall
I really don't know 'shrooms at all
Brilliant hues and perfumes sweet
Twirl 'round about and grandly meet
As fine illusions everywhere
I've looked at 'shrooms that way

But now its just another year
With rainy weather soon turned clear
Really much too much to bear
Dry weather every day

I've looked at 'shrooms from both sides now
From hit and miss, but still somehow
Just the illusions I recall
I really don't know 'shrooms at all.

By Joel Horman, Editor of the ***Long Island Sporeprint***
Originally published in the Autumn 2014 edition

Monomethylhydrazine Content in the Ascomycota

By Michael Beug

The article about *Gyromitra* in ***Omphalina VI***, Issue 3 (Miller et al. 2015) prompted me to see what I can learn about *Gyromitra* toxins. I found one highly useful article (Andary et al. 1985).

There are between nine and eleven different gyromitrins in *Gyromitra esculenta* and all decompose to produce monomethylhydrazine (MMH) in a two-step process. MMH is both a cytotoxic poison and a potent carcinogen. It is a very unusual toxin in that the difference between a harmless does and a lethal dose is small. Thus, a person might be able to eat a large meal of *Gyromitra esculenta* two or three days in a row with no ill effect at all and then die from a subsequent meal. Of even greater concern is the carcinogenicity. In studies with mice, Toth and his associates (Toth, 1972; Toth and Nagel 1978; Toth and Patil 1980) found that even a single dose of MMH (or any of its precursors), one-quarter of the LD_{50}, would cause lung, preputial gland and liver tumors. Thus, even one meal of *Gyromitra esculenta* might be starting tumors in the unsuspecting diner.

In an attempt to understand the high variability in toxicity of *Gyromitra esculenta* collections, Andary et al. examined the variation of gyromitrin levels in *Gyromitra esculenta* as a function of collection site, altitude, duration of preservation, and type of preservation. They actually measured the amount of the active toxin monomethylhydrazine (MMH) that is produced when the gyromitrins are broken down (either by their analysis techniques or by cooking and ingestion of the mushrooms). They also examined MMH levels produced in a wide range of Ascomycota.

They found that MMH levels vary only about ± 3% between *Gyromitra esculenta* fruitbodies from a single site. However, the stipe contains about twice as much MMH as the cap. In the Pyrenees, their main study area, *Gyromitra esculenta* collected at a middle altitude of 900 to 1200 meters are 5-6 times more toxic than those collected at 2200m are. They found that levels of MMH decrease about 50% during one week of air-drying at room temperature but then decrease very slowly in following months, eventually dropping to around 10% of initial values. The desiccation of fresh specimens by heat (55 C) is not nearly as effective as generally presumed and is equivalent to 5 or 6 days drying at room temperature and leads to a 50% drop in MMH levels. The MMH levels are stable at refrigerator temperatures. Freezing and then thawing accelerates loss of MMH and is comparable to drying at room temperature for two months – leading to a 90% drop in MMH levels.

Viernstein et al. (1980) studied the MMH levels in *Gyromitra gigas* and *Gyromitra fastigiata* (now *Gyromitra brunnea*). I have not been able to obtain a copy of their paper. Andary et al. cite Viernstein but give no clue as to their results. Thus, we are left to guess how much MMH might be in *Gyromitra gigas*. However Andary et al. did study a number of other Ascomycetes. They found that *Cudonia circinans* had almost the same level of MMH as *Gyromitra esculenta*. All other Ascomycota that they tested had 0 to 10% as much MMH as *Gyromitra esculenta*. Notably, no MMH was found in *Morchella esculenta*, *Disciotis venosa* or *Discina perlata* (now *Gyromitra ancilis*). *Helvella macropus*, *Helvella crispa*, *Helvella lacunosa*, *Helvella elastica*, *Helvella acetabulum*, *Leotia lubrica*, *Spathularia flavida*, *Otidea onotica* and *Neobulgaria pura* all had MMH levels of 5-10% of the amount in *Gyromitra esculenta*.

I next searched the North American Mycological Association (NAMA) database for North American poisonings attributed to any species in the genus *Gyromitra*. I found numerous serious poisonings because of consumption of *Gyromitra esculenta*. While there have been no deaths reported for this species in North America, cases of hospitalization with severe liver damage occur nearly every year. When you add the fact that these mushrooms are also very potent carcinogens, it is very clear that consumption of *Gyromitra esculenta* is a very dangerous practice. Since both *Gyromitra infula* and *Gyromitra ambigua* are in the Esculenta subclade of *Gyromitra*, these species should be avoided as well.

A search of the NAMA database turned up no poisonings that I could clearly attribute to MMH toxicity other than *Gyromitra esculenta* poisonings. The few reported cases of poisoning by *Gyromitra gigas*, *Gyromitra montana* or *Gyromitra korfii* could all be attributed to one of three factors: 1) misidentification (*Gyromitra esculenta* was the mushroom actually consumed); 2 undercooking; or 3) individual sensitivity. An examination of the numerous reported poisonings by morels and verpas turned up the same three factors (misidentification, undercooking and individual sensitivity) plus the additional fact that morels (and many other species) can accumulate arsenic and lead, in some cases causing serious poisoning.

Clearly, consumption of *Gyromitra esculenta* is a very dangerous practice. Consumption of other *Gyromitra* species (except for members of the Esculenta subclade) is probably safe so long as they are well cooked. For added safety, consider doing the cooking outdoors. Thus any MMH, if present, is safely dissipated. *Gyromitra*, *Verpa*, *Morchella*, *Disciotis* and *Peziza* species all are toxic if not thoroughly cooked. All are suspect if growing on contaminated sites (places where herbicides, pesticide or heavy metal contamination is present). All cause adverse reactions in some individuals, even if well cooked.

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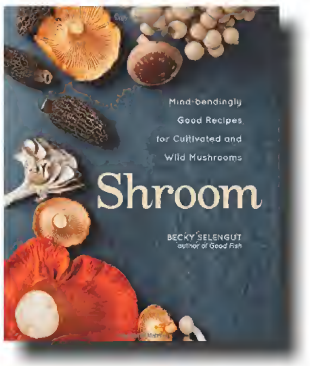
Meet Jennifer Knox, Marketing Committee Chair

Jennifer Knox took the position of Marketing Committee Chair in January and has been involved with designing a membership renewal program, and editing some of the messages we send members. She brings new ideas and technical skills to us. Jennifer has over twenty years experience directing communications for non-profit organizations such as the Audubon Society, the Garden Club of America, and the National Arts Club. Originally from the California high desert, she has lived in Japan, Milwaukee, and New York City. She is also a poet with four books and publication credits in the ***Best American Poetry*** series, ***The New Yorker***, and ***The New York Times***. She currently teaches business communications at Iowa State University. In her (rare) spare time, she hunts the radiant *Laetiporus sulphureus*. Jennifer is a member of the Prairie States Mushroom Club.

Shroom: Mind-bendingly Good Recipes for Cultivated and Wild Mushrooms



Becky Selengut
2014, Andrews McMeel, Kansas City, Mo
978-1449448264 (240 pages, hardcover, $35.00)

The subtitle of Becky Selengut's Shroom promises "mind-bendingly good recipes for cultivated and wild mushrooms," and, mostly, it delivers. It entirely succeeds at demonstrating ways to use mushrooms in unique modern dishes--with many crowd pleasers in the bunch. Selengut is a Seattle-based teaching chef who carries the teaching kitchen into your kitchen with witty remarks, personal anecdotes, an inspiring blend of reassurance and challenge, and a crystal-clear lesson plan. Her goal is to teach cooks at all levels "how to cook and eat the world's best mushrooms" inspired by the tastes of "a multicultural culinary America" as opposed to "European-centric recipes bathed in cream and butter." In keeping with the pedagogical approach, the introduction features helpful sections such as "Rehydrating 101" and "Freezing 101." Supplementary materials, including how-to videos and an errata page, are available on Selengut's website (http://www.beckyselengut.com/).

Shroom devotes a chapter to 15 different mushrooms ranging from grocery store basics like buttons and oysters to woodland rarities like black trumpets and truffles. Each chapter begins with a fact sheet featuring a flavor profile and possible substitutions, as well as cleaning and storing instructions. Five recipes featuring the mushroom follow, ordered by increasing difficulty.

When Selengut writes that the last recipe in each chapter "is meant to appeal to professional chefs," she's not kidding. These recipes require loads of time and kitchen tools, along with multiple runs of the dishwasher. So we mostly avoided them - with a few exceptions, such as King Trumpet "Scallops" with Carrot Puree, Leek, and Parsley Vinaigrette. Reasonably tasty, it made a stunning presentation. We found it tasted better at room temperature, although the instructions assume you'll serve it immediately after plating. If, like us, you don't have a full kitchen staff, you will be serving it at room temperature.

Many of the dishes also require lots of groceries - even the beginning or intermediate recipes. The ingredient lists can be daunting: squab, Douglas fir tips, duck eggs, and mushrooms that you will only find the Pacific Northwest. We often substituted ingredients and opted for more common mushrooms. Also take note of the pieces of kitchen equipment that you will be using and then washing. The total may strike you as just the way you want to be spending your weekend and some cash--or as a whole lot of hassle. We looked upon each recipe as a learning experience, and fortunately for us, the highlights totaled up well. Here are our faves.

Bread Puddings with Seared Beech Mushrooms and Thyme
This one earned *Shroom* its status as a keeper. It greatly exceeded expectations by putting some bite into bread pudding's usual toothless texture. And unlike many recipes in the book, this features ingredients you probably have on hand. The technique Selengut teaches here is what heightened this homely standby: she has you leave the beech mushrooms whole on their trip to the hot skillets. As a result, even baked in the eggy goo they keep their firm structure.

Roasted Lion's Mane and Cauliflower with Zante Currants and Red Onion
This recipe first reads as deceptively simple, but the whole exceeded the parts. The lion's mane with its white fluff twinned adorably with the cauliflower, and the flavors matched like notes in a chord. We served this dish to 50 happy people at our club's annual mushroom banquet, substituting the more readily available beech mushrooms

and following Selengut's suggestion of adding roasted chick peas to create main course-worthy substance to the dish.

Maitake with Roasted Red Pepper Sauce and Smoked Paprika
This recipe introduces a key mushroom cooking technique: the skillet press. Many of Selengut's instructions include the phrase "heat two skillets," generally a sign that a cost/deliciousness analysis needs to be undertaken. But here, pressing a layer of maitake slices between two hot skillets intensifies the flavor and texture of this ruffled delicacy. We made a note to try a waffle iron next time for a more steady, even sear - it might be the perfect way to prepare fall's maitake hauls for the freezer. The red pepper sauce, a brilliant flourish in both color and flavor, would be a dazzling topper to many dishes, too; fish fillets next?

Beech Mushrooms in Phyllo with Georgian Walnut Sauce and Pomegranate
Many of the accompanying sauces in the book were outstanding. This walnut sauce inspired us to brave the beech mushroom chapter's most difficult recipe--and phyllo dough. Light, crispy buttered layers of phyllo are wrapped around a mix of beech and button mushrooms sautéed with ginger. It's a surprising flavor - fresh and bright against the earthiness of the mushrooms - and one that Selengut returns to throughout the book. There are many sauces you could serve under these delicate appetizers, but Selengut's velvety walnut sauce with pomegranate is a show-stopper. Another winner: the piquant red onion jam served atop the Spicy Black Bean, Poblano and Oyster Mushroom Burger (although the jam proved brighter than the burger itself).

Black Trumpet Pate with Sage and Marsala
Selengut's favorite recipe is hidden as well as the mushroom it features. Near the back of the book, in the headnote to black trumpet pate with sage and marsala, she reveals her preference and the fact that if she's around, the recipe serves one. Everything about this dish delights. Even rehydrating the black trumpets and then reducing the soaking water creates a fragrant pleasure, and beyond the mushrooms themselves, you'll have everything you need in your kitchen - butter, onions, a pinch of this and that, and a half empty bottle of marsala that you bought years ago for some other recipe. Use more lemon juice than the recipe calls for. Grilled King Trumpets with Orange and Black Pepper inspires similar gluttony. Don't believe that it serves 4. You will eat it all yourself.

Fifty of the seventy-five recipes are vegetarian. Although we didn't intend to limit ourselves to the vegetarian selections, none of the meat and seafood options made our cut. Often the most complex recipe in a chapter included meat. Maybe someone else can tell us how the "braised rabbit with truffle-stuffed rabbit loin, chanterelle cream, roasted root vegetables, and shaved truffles" turned out--and if you were hungry all over again after you finally got the kitchen cleaned up.

Some of the dishes we made, no matter where their position in the 5-recipe sequence, suffered from over complication, drowning out the mushrooms as much as any buttery and creamy haute cuisine concoction would - such as the king trumpet toasts with Gruyère, apricot jam, and arugula. This combination completely muffled the trumpets. Others needed sour notes - perhaps a shot of lemon juice or vinegar - to balance the sweet and dense vegetables that Selengut favors such as carrots, sweet potatoes and squash. Some of the recipes with lengthier ingredient lists - like Hedgehog Cashew Chili and Dandan Noodles with Shiitakes, Pork, Pickled Mustard Greens, and Spicy Chili Oil - had intriguing flavors, but the end results didn't merit the effort. Luckily the clunkers became easier to spot as we grew more familiar with the book.

Shroom outdoes all other mushroom cookbooks with Clare Barboza's full page glossy photographs. The recipes haven't dimmed our visions of morels in butter and cream but they definitely invaded some mind space.

Jennifer Knox and Barbara Ching

A Field Guide to Tropical Amazon Mushrooms

Daniel Winkler and Larry Evans, undated (2014)
Harbour Publishing
http://www.harbourpublishing.com
ISBN 978-0-99042-380-5
$8.95
(Available from Daniel at www.MushRoaming.com)

In the past few years, Harbour Publishing has released two short brochure-type guides to the edible mushrooms of the Pacific Northwest and California by mushroom adventurer Daniel Winkler (see reviews in the January-February and November-December 2012 issues of *The Mycophile*). Now Daniel is back, along with fellow adventurer and myco-movie-star Larry Evans of *Know Your Mushrooms* fame, with a guide for the tropical Amazon, including the westernmost portion of Brasil and the lower eastern slope of the Andes in Colombia, Ecuador, Peru, and Bolivia. Like its predecessors, this publication is best described as a laminated, accordion-folded, small poster. When folded, it is about 9 inches high and half as wide. Unfolded, it extends to about 36 inches, still 9 inches high.

Two panels provide a brief introduction to mushrooms, their classification, and ecosystem functions. In the previous publications, users were cautioned not to rely on the publication alone for identifying mushrooms, especially ones intended for the table. That warning should have been included here too. This section has a number of little mistakes, such as referring to the order Agaricales as a class (the ending "ales" signifies the taxonomic level Order), to the genera *Schizophyllum* and *Pycnoporus* as species, and to soil nutrients such as nitrogen as "minerals." However, these are details that most readers would not notice and that do not detract from the usefulness of the guide.

Over 80 "species" are presented—some actually are species groups or are identified only to genus, which is not surprising given the limited mycological research that has gone on in the neotropics. Their photos and accompanying text are presented four or five per panel. Unlike the previous two guides that focused on edible and toxic species, this one does not utilize a system of icons to indicate edibility.

The species descriptions/comments, which were written by Evans, are very brief and do not provide much information for making confident determinations. Typically the size is mentioned, along with a few key features and an indication of edibility, either in general or with reference to use by local people. No information about microscopic features is provided. Each species is illustrated by a color photo or, in some cases, two photos with the second typically being a close-up of details. The images, nearly all taken by Winkler, are rather small (mostly about 6.5 × 3.5 cm). Most of them are of quite good quality and are effective in displaying these beautiful, sometimes bizarre, mushrooms despite the small size. The bulk of the species included are rather distinctive in appearance and so it seems likely that they can be reasonably well identified by means of picture-matching. However, few of the groups have received more than cursory study and so the degree to which look-alike species might occur is pretty much unknown.

If you're interested in a visual teaser that could well entice you to join the authors on one of their trips to the tropics (though you would be advised not to listen to Evans's stories about, let's say "interesting," encounters between humans and many of the small creatures that share their Amazonian home with these beautiful fungi), this might do the trick in a convenient, affordable format.

Steve Trudell

!WILDACRES 2015 FORAY!

The Wildacres 2015 Foray is scheduled for September 17-20. Wildacres Retreat is located just off the Blue Ridge Parkway near Little Switzerland, not too far from Spruce Pine, North Carolina. Wildacres is renowned for the identification of new species to the foray and to the identification of new species to the mushroom kingdom. You will have the opportunity to search for fungi along the creek sides of Armstrong Creek, Linville Falls and Crab Tree Falls, in the highlands of Mount Mitchell, and in many other areas along the beautiful Blue Ridge Parkway. Our mycologist for this year is Andy Methven! We are so excited to have Andy back with us. Other noted mycologists will also be in attendance. Come join us and see who shows up. It will be a fantastic weekend. Please see http://www.wildacres.org/ for more information about the retreat center, or contact me, Glenda O'Neal, by email: glendakoneal@yahoo.com, or by phone (423) 863-2742 for foray information. Registration fee for this event is $235 per person, and includes three nights lodging and eight meals double occupancy. The registration form may be found on the NAMA website. Here is the link: http://www.namyco.org/images/pdf_files/Wildacres_Registration_2015.pdf

This foray is limited to 40 NAMA members. Registration is expected to go quickly this year with the NAMA annual foray in the same area the following weekend.

Learning about Mushrooms

By Sandy Sheine, NAMA Education Chair
http://www.namyco.org/education.php

So you are eager to learn about mushrooms but don't know how to get started!

Let NAMA be your guide to the Fungi Kingdom and you will soon find direction on how to learn about the mushrooms growing in your native habitat. Members of our NAMA Education Committee strongly suggest that you first join one of our 88 NAMA-affiliated mushroom clubs in Canada, the USA and Mexico. Many of our members do not belong to a club because they feel that they live too far away from where the club meets. Here are some of the benefits that are available to you as a club member: almost all clubs have websites, newsletters, internet chat groups which offer both information and answers to your questions, Facebook pages, courses on learning about mushrooms and lending libraries. Most clubs hold monthly meetings with professional speakers, often previewed by a mushroom identifying session or beginner course. Field trips and forays are held with knowledgeable leaders. Species lists and photos of the collections from those events are made available to club members. From my experience, club members are both eager and generous to share their knowledge with beginners. Clubs also offer weekend trips and forays to which you might be able to travel. Since 1977, the Northeastern Mycological Federation together with the eastern Canadian Clubs sponsors a huge foray every year. The Eagle Hill Institute in Maine holds week long courses on mushrooms every summer. Other mushroom courses are listed on the NAMA website.

Use the NAMA website which is constantly being updated. A new section on the Education page will be devoted to beginner education, including recommended books, and websites. A full set of Michael Beug's excellent teaching programs and videos can be purchased (more information here). The NAMA website also contains information on toxicology, cultivation, children's activities, mushroom dyes, speakers bureau, listings of upcoming forays and back issues of The Mycophile and McIlvainea. Eastern and Western Mushroom Teaching Kits are also available for rent and can be used for children or for adults.

Welcome to the fascinating Kingdom of fungi.

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Newsletter of the North American Mycological Association
THE MYCOPHILE

Mushroom of the Issue

Clitocybe glacialis Photo: Drew Henderson

Snow Melt Fungus

Clitocybe glacialis (formerly *Lyophyllum montanum*) looks a lot like a small *Lepista nuda*, except it appears in spring at snow melt edges in montane habitats under Douglas fir, Pacific fir and Engelmann spruce. Note the extensive mycelium at the stem base. These two specimens were photographed in the Cascades on the Merritt Lake Trail, Nason Ridge at the Wenatchee National Forest in Washington by new NAMA member Drew Henderson.